

# CHAPTER TWO: WATERSHED ISSUES, OPPORTUNITIES, GOALS, AND OBJECTIVES

## DES PLAINES RIVER WATERSHED-BASED PLAN

### CONTENTS

2	Watershed Issues, Opportunities, Goals, and Objectives .....	2-3
2.1	Watershed Issues .....	2-3
2.2	Watershed Opportunities .....	2-7
2.3	Watershed Vision .....	2-14
2.4	Watershed Goals and Objectives .....	2-15
2.4.1	Watershed Goal #1: Water Quality Improvements .....	2-16
2.4.2	Watershed Goal #2: Regional Green Infrastructure and Natural Resources Improvements .....	2-18
2.4.3	Watershed Goal #3: Flood Damage Reduction .....	2-19
2.4.4	Watershed Goal #4: Funding, Installing, And Maintaining Stormwater Infrastructure .....	2-20
2.4.5	Watershed Goal #5: Community And Agency Coordination .....	2-22
2.4.6	Watershed Goal #6: Sustainable Agriculture Systems .....	2-23
2.4.7	Watershed Goal #7: Education And Outreach .....	2-24

### LIST OF FIGURES

Figure 2-1:	Butler Lake algae .....	2-16
Figure 2-2:	Parking lot bioswale with native vegetation .....	2-18
Figure 2-3:	Sandbagging efforts to reduce flooding .....	2-19
Figure 2-4:	Protected culvert .....	2-20
Figure 2-5:	Multi-partnership project groundbreaking ceremony .....	2-22
Figure 2-6:	Grassed waterway installed as an agriculture BMP .....	2-23
Figure 2-7:	Watershed planning committee .....	2-24

### LIST OF TABLES

Table 2-1:	Specific Issues/Concerns Identified by Stakeholders .....	2-4
Table 2-2:	Specific Opportunities and Strategies Identified by Stakeholders .....	2-8
Table 2-3:	Des Plaines River Watershed Plan Stakeholder Vision Exercise Results .....	2-14

**COMMON ACRONYMS/ABBREVIATIONS USED IN CHAPTER 2**

APMP – Aquatic Plant Management Plan  
BMP – Best Management Practices  
CLC – College of Lake County  
DPR planning area – Des Plaines River Watershed Planning Area  
DRWW – Des Plaines River Watershed Workgroup  
FEMA – Federal Emergency Management Agency  
GSS – Grade Stabilization Structure  
HOA – Homeowners Association  
Illinois EPA – Illinois Environmental Protection Agency  
PAH – Polycyclic Aromatic Hydrocarbons  
RMP – Resource Management Plan  
SMC – Lake County Stormwater Management Commission  
SMU – Subwatershed Management Unit  
TMDL – Total Maximum Daily Load  
TSS – Total Suspended Solids  
USGS – United States Geological Survey  
VLM - Volunteer Lake Monitoring  
WASCOB – Water and Sediment Control Basin  
WI – Wisconsin  
WRAPP – Wetlands Restoration and Preservation Plan

## 2 WATERSHED ISSUES, OPPORTUNITIES, GOALS, AND OBJECTIVES

### 2.1 WATERSHED ISSUES

One of the first tasks the Des Plaines River watershed committee (watershed planning committee) undertook was to identify issues that the Des Plaines River Watershed-Based Plan should address and opportunities or strategies to address those issues. Participants (watershed stakeholders) at the March 17, 2016 kick-off planning meeting (see **Appendix A** for stakeholder meeting minutes) identified issues and voted to determine priorities at the April 28, 2016 planning meeting. Watershed stakeholders received 10 votes each for watershed issues (multiple votes could be used on one topic/issue).

Issues related to water quality received the most votes, followed by issues related to regional green infrastructure and natural resources. Flood damage reduction and stormwater infrastructure issues received a similar number of votes and when combined slightly exceeded water quality issues.

A full list of the issues/concerns of watershed stakeholders is available in Table 2-1. Issues were grouped into categories by topic and later organized into goal categories. It is important to note that although watershed stakeholders voted on issues in certain categories, many issues listed in Table 2-1 could apply to several of the categories.

**WATERSHED PLANNING COMMITTEE:** A committee comprised of SMC staff and watershed stakeholders (including the Des Plaines River Watershed Workgroup), with a goal of creating an umbrella watershed-based plan for the DPR planning area and reducing nonpoint source pollution. See Section 2.4 compiled by previous watershed-based plans in the DPR planning area and watershed stakeholders.

## DES PLAINES RIVER WATERSHED-BASED PLAN - 2018

**Table 2-1: Specific Issues/Concerns Identified by Stakeholders**

The “X” symbol indicates the Category the issue was voted on by the watershed stakeholders and the “\*” symbol indicates other categories the issue can apply to as well.

# OF VOTES	WATERSHED ISSUES	GOAL CATEGORIES						
		WATER QUALITY IMPROVEMENTS	REGIONAL GREEN INFRASTRUCTURE & NATURAL RESOURCES	FLOOD DAMAGE REDUCTION	FUNDING, INSTALLING, & MAINTAINING STORMWATER INFRASTRUCTURE	COMMUNITY & AGENCY COORDINATION (NOT A VOTING CATEGORY)	SUSTAINABLE AGRICULTURE SYSTEMS (NOT A VOTING CATEGORY)	EDUCATION & OUTREACH
21	Not enough wetlands preserved and restored	*	X	*		*	*	
20	Road salt creating chloride pollution	X	*		*	*		*
15	Condition of stormwater infrastructure (pipes, detention basins, etc.), <i>Example: North Libertyville Estates</i>	*		*	X	*		
13	There is a disconnect for some public works agencies between improving stormwater conveyance and the negative impacts of stormwater on lakes and streams	X			*	*		*
13	Undesirable or invasive aquatic plants & animals	*	X			*	*	*
13	Damages from flooding and lack of flood control measures	*	*	X	*	*		*
13	Too much stormwater runoff from impervious surfaces	*	*	X	*	*		*
12	Phosphorus pollution	X	*		*	*	*	*
12	Lack of stream or river maintenance	*		*	X	*		*
9	Loss of old growth trees (oaks)	*	X			*	*	*

# OF VOTES	WATERSHED ISSUES	GOAL CATEGORIES						
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8	Impacts of water quality on recreational opportunities (poor water quality limits recreational opportunities such as fishing)	X	*			*		*
8	Public does not understand the issues					*		X
6	Lake shoreline erosion	*	*		X	*		*
5	Coal tar sealant pollutants	X	*		*	*		*
5	Invasive plant issues (teasel)	*	X			*	*	*
5	Insufficient capacity of stormwater infrastructure for increasing growth	*	*	X	*	*		*
5	Dams and dam removal	*	*	*	X	*	*	*
5	Education of general public on invasive species and the water quality impacts of native fauna	*	*			*	*	X
3	Not enough volunteer efforts on rivers and adjacent forest preserve areas	*	X			*		*
3	Understanding conflicts and owner responsibilities (Social issues with fellow neighbors)	*	*			*		X
2	Lack of TMDL information - ( <i>Wheeling drainage ditch/reach</i> )	X				*		*
2	Public understanding of agency roles					*		X

## DES PLAINES RIVER WATERSHED-BASED PLAN - 2018

# OF VOTES	WATERSHED ISSUES	GOAL CATEGORIES						
		WATER QUALITY IMPROVEMENTS	REGIONAL GREEN INFRASTRUCTURE & NATURAL RESOURCES	FLOOD DAMAGE REDUCTION	FUNDING, INSTALLING, & MAINTAINING STORMWATER INFRASTRUCTURE	COMMUNITY & AGENCY COORDINATION (NOT A VOTING CATEGORY)	SUSTAINABLE AGRICULTURE SYSTEMS (NOT A VOTING CATEGORY)	EDUCATION & OUTREACH
2	Who to Call...for questions? Where is this located?					*		X
1	River flooding impacts on adjacent lakes ( <i>east side of Lake Minnear, invasive species impacts</i> )	X		*	*	*		
1	Not resilient to climate change	*	X	*	*	*	*	*
1	Need additional USGS stations	*		X	*			
1	Lack of understanding of impacts coming from leaching septic fields	*			*	*	*	X
0	Lack of coordination for mosquito abatement and improper drainage; stagnant water as a source of mosquitos	*	*	*	X	*		*
0	Recreational conflicts – canoeing vs. speedboats	*	*			X		*

## 2.2 WATERSHED OPPORTUNITIES

Following the identification of watershed issues, stakeholders provided input on what opportunities or strategies they thought would address watershed issues. Stakeholders also considered what was desirable about the watershed and identified these characteristics as opportunities for preserving for the future. Watershed stakeholders received 10 votes each for voting on watershed opportunities and strategies (multiple votes could be used on one topic).

Stakeholders voted most often for education and outreach and community and agency coordination as the opportunities and strategies to address watershed issues. Importantly, education and outreach to individual landowners on a variety of topics received the most votes of any single opportunity or strategy. Regional green infrastructure and natural resources and stormwater infrastructure also received a large number of votes. The opportunities and strategies identified by stakeholders are listed in Table 2-2. It is important to note that although watershed stakeholders voted on watershed opportunities in certain categories, many opportunities listed below could apply to several of the categories.

## DES PLAINES RIVER WATERSHED-BASED PLAN - 2018

**Table 2-2: Specific Opportunities and Strategies Identified by Stakeholders**

The “X” symbol indicates the Category the issue was voted on by the watershed stakeholders and the “\*” symbol indicates other categories the issue can apply to as well.

# OF VOTES	WATERSHED OPPORTUNITIES & STRATEGIES	GOAL CATEGORIES						
		WATER QUALITY IMPROVEMENT	REGIONAL GREEN INFRASTRUCTURE AND NATURAL RESOURCES	REDUCE FLOOD DAMAGE	FUNDING, INSTALLING & MAINTAINING STORMWATER INFRASTRUCTURE (GRAY AND GREEN)	COMMUNITY & AGENCY COORDINATION	SUSTAINABLE AGRICULTURE SYSTEMS	EDUCATION & OUTREACH
29	Educate individual landowners on: maintaining stormwater management systems best management practices yard waste management water quality and water resources flood damage reduction phosphorus reduction (countywide ban) stream erosion & lakes management ecosystems more (public) postings for resident participation in programs or projects technical references	*	*	*	*	*	*	X
18	Clearing debris and restoration of natural areas – <i>i.e. North Libertyville Estates retention: erosion, cattails, drainage</i>	*	*	X	*		*	



# OF VOTES	WATERSHED OPPORTUNITIES & STRATEGIES	GOAL CATEGORIES						
		WATER QUALITY IMPROVEMENT	REGIONAL GREEN INFRASTRUCTURE AND NATURAL RESOURCES	REDUCE FLOOD DAMAGE	FUNDING, INSTALLING & MAINTAINING STORMWATER INFRASTRUCTURE (GRAY AND GREEN)	COMMUNITY & AGENCY COORDINATION	SUSTAINABLE AGRICULTURE SYSTEMS	EDUCATION & OUTREACH
17	Restoring wetlands to a sustainable functional system	*	X	*	*		*	
14	Smarter management of stormwater runoff	*	*	*	X	*		*
13	Utilizing land along tributaries for storage and treatment of stormwater – (green infrastructure)	*	*	X	*		*	
13	Coordination/consistent efforts for future and current land use (green infrastructure planning tools)	*				X		*
12	Expand preserved open space, trees and plants (including old growth trees), wildlife (corridors), and habitat	*	X				*	*
11	Sustainable farm practices	*	*				X	*
10	Plant native plants in buffers along the Des Plaines River	*	X	*		*	*	*
10	Having more intense modeling of the impacts of planned land uses	*				X		*
9	Educate local public work departments on chloride (road salt) reduction practices	*	*		*	*		X

## DES PLAINES RIVER WATERSHED-BASED PLAN - 2018

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		WATER QUALITY IMPROVEMENT	REGIONAL GREEN INFRASTRUCTURE AND NATURAL RESOURCES	REDUCE FLOOD DAMAGE	FUNDING, INSTALLING & MAINTAINING STORMWATER INFRASTRUCTURE (GRAY AND GREEN)	COMMUNITY & AGENCY COORDINATION	SUSTAINABLE AGRICULTURE SYSTEMS	EDUCATION & OUTREACH
8	Manage invasive species: flora and fauna (i.e. teasels)	*	X			*	*	*
8	Need additional funding for restoration efforts	*	*		X	*		*
6	Determine pollutant contribution from wastewater treatment plants to streams	X			*	*		
6	Expand Lake County Forest Preserves	*	*			X	*	*
6	Better enforcement of existing regulations	*				X		*
6	Removing drain tiles to ditches upstream	*	*			*	X	*
5	Retrofitting of detention basins	*	*	*	X		*	
5	Better coordination and partnerships among agencies, municipalities and landowners for watershed projects ( <i>i.e. Lincolnshire drive berm, Conservation @ Home, river management with adjacent landowners, multiple groups – bigger scope</i> )	*	*			X		*

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5	Promote pollution prevention – (i.e. give a hoot, don’t pollute)	*	*			*		X
4	Villages adopt ordinances to manage phosphorous	*	*			X		*
4	CLC or other institutions provide technical education	*	*	*	*	*	*	X
4	Use social media to educate corporations, agencies, the public, and municipalities to encourage the implementation of BMPs and participation in restoration efforts	*	*			*		X
3	Create a Stream Management Program – “Adopt a Stream”	*		*	X	*		*
3	Creating better standards for BMPs for roadways and drainage projects	*	*	*	X	*		*
3	Having enough resources to implement programs/services – new ways to fund and stormwater management as utility	*			X	*		*
3	Engage community action – stewardship and volunteering (having a bigger voice)	*	*			X	*	*

## DES PLAINES RIVER WATERSHED-BASED PLAN - 2018

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3	Expand and preserve small scale farming	*	*			*	X	*
2	Using permeable pavement in development and redevelopment (improving infiltration)	*	*		X			*
2	Work with nurseries to provide attractive designs for using native plants for stream buffer and bank stabilization	*	*	*	X		*	*
2	Expand stormwater infrastructure funding and technical assistance (HOAs, etc...)	*	*		X	*		*
2	Funding support for developing better regulations to control impervious surfaces	*		*	X	*		*
2	Watershed involvement with Illinois EPA on Nutrient Loss Strategy	*				X	*	
2	Educate students on flood reduction, restoration, recreational value (i.e. Gowe Beach)	*	*	*		*		X
2	Making public service a high school education requirement	*				*		X

# OF VOTES	WATERSHED OPPORTUNITIES & STRATEGIES	GOAL CATEGORIES						
		WATER QUALITY IMPROVEMENT	REGIONAL GREEN INFRASTRUCTURE AND NATURAL RESOURCES	REDUCE FLOOD DAMAGE	FUNDING, INSTALLING & MAINTAINING STORMWATER INFRASTRUCTURE (GRAY AND GREEN)	COMMUNITY & AGENCY COORDINATION	SUSTAINABLE AGRICULTURE SYSTEMS	EDUCATION & OUTREACH
1	Local communities and residents have a role in water quality improvements	*	*			X	*	*
1	Provide liaison to assist with permitting processes	*			*	X		
1	Identify watershed champions in each community	*				X		*
0	Better water quality would attract more wildlife ( <i>more indicator species (i.e. eagles)</i> )	X	*			*		*
0	Revise existing regulations and codes to create more uniformity	*				X		
0	Better access to headwaters – ( <i>Wisconsin - different ways of doing things</i> )	*				X		

## 2.3 WATERSHED VISION

The watershed planning committee participated in an exercise to develop a vision statement for the watershed. The vision serves to focus the aim of the group. While different groups implementing the plan may have different goals and objectives, the achievement of all should fit under the overarching vision statement.

The vision statement exercise began by asking the following questions:

1. What matters to you most about where you live in the DPR planning area?
2. What positive changes would you like to see in the watershed?
3. What is your dream for our watershed community? (How would the watershed look if the watershed plan is successful?)
4. Who will be involved in helping achieve the watershed vision over the next 10 years?

The watershed planning committee (during this vision statement exercise) was divided into four facilitated breakout sessions to discuss the answers/phrases to the vision statement exercise; see Table 2-3 for voting results of the vision exercise. Each session voted on their preference of vision phrases to share with the overall watershed planning committee. The watershed planning committee was then able to vote on which group's (1-4) vision statement exercise phrases should be included (or combined) into the Des Plaines River Watershed-Based Plan vision statement.

**Table 2-3: Des Plaines River Watershed Plan Stakeholder Vision Exercise Results**

VOTE RESULT (%)	WHAT MATTERS TO YOU MOST ABOUT WHERE YOU LIVE IN THE DPR PLANNING AREA?	WHAT POSITIVE CHANGES WOULD YOU LIKE TO SEE IN THE WATERSHED?	WHAT IS YOUR DREAM FOR OUR WATERSHED COMMUNITY? (HOW WOULD THE WATERSHED LOOK IF THE WATERSHED PLAN IS SUCCESSFUL?)	WHO WILL BE INVOLVED IN HELPING ACHIEVE THE WATERSHED VISION OVER THE NEXT 10 YEARS?
0%	<b>Group 1:</b> My community (restoration of pond) – debris, sediment, erosion in rivers, lakes and streams	<b>Group 1:</b> Better water quality	<b>Group 1:</b> Unpolluted water and more natural areas	<b>Group 1:</b> Individual responsibility
21%	<b>Group 2:</b> Flood control measures to limit property damage	<b>Group 2:</b> Accommodate wetland restoration to establish native vegetation and improve habitat diversity.	<b>Group 2:</b> River as a destination	<b>Group 2:</b> Government, businesses, public and private entities, and residents.

VOTE RESULT (%)	WHAT MATTERS TO YOU MOST ABOUT WHERE YOU LIVE IN THE DPR PLANNING AREA?	WHAT POSITIVE CHANGES WOULD YOU LIKE TO SEE IN THE WATERSHED?	WHAT IS YOUR DREAM FOR OUR WATERSHED COMMUNITY? (HOW WOULD THE WATERSHED LOOK IF THE WATERSHED PLAN IS SUCCESSFUL?)	WHO WILL BE INVOLVED IN HELPING ACHIEVE THE WATERSHED VISION OVER THE NEXT 10 YEARS?
37%	<b>Group 3:</b>  Protect and improve natural resources, water quality and habitat.	<b>Group 3:</b>  Improved biodiversity	<b>Group 3:</b>  Residents demand and value quality water resources and recreational opportunities	<b>Group 3:</b>  Partnership between public and private stakeholders to improve education and planning
42%	<b>Group 4:</b>  Sustainable planning and implementation for environmental health to achieve clean, healthy water, preservation of regional green infrastructure, etc.	<b>Group 4:</b>  Comprehensive community education and outreach to foster support for and participation in improvements/changes.	<b>Group 4:</b>  Sustainable landscaping with balance between built environment (development) and natural environment. Cleaner lakes, better streams, more secure biodiversity, and large sections of stream meeting aquatic life criteria	<b>Group 4:</b>  Everyone

The participant responses to the exercise resulted in the following vision statement for the DPR planning area:

***The Des Plaines River watershed planning area will be a destination valued by residents, businesses, and governments that join together to actively engage in education and participate in improving water quality. Stakeholders will preserve and enhance regional green infrastructure, resulting in cleaner streams and lakes, better plant and animal biodiversity, and reduced flood damage – while balancing a sustainable native landscape with development and economic growth.***

## 2.4 WATERSHED GOALS AND OBJECTIVES

The watershed planning committee generated and prioritized seven (7) watershed goals to address watershed stakeholder issues/concerns. Establishing these watershed goals allowed the watershed planning committee to develop objectives and outcomes for each goal. The goals were central to the development of the watershed action plan (**Chapter 6**). The goals and objectives reflect watershed conditions, address watershed stakeholder priority issues, consider expected future changes, and meet current and possible future funders' expectations.

Over the period of the planning year, measurable indicators were assigned to each goal to help measure future progress toward meeting each goal as the watershed action plan is implemented. The action plan contains recommended:

## DES PLAINES RIVER WATERSHED-BASED PLAN - 2018

- Programmatic actions that address flooding; water quality; stormwater management and drainage; natural resources; and education, outreach, coordination, and implementation goals; and
- Site-specific actions that recommend BMPs for specific problem locations identified during inventories and assessments.

**Chapter 7 Plan Implementation and Evaluation** and **Appendix M Evaluation Scorecards** examine the watershed plan goals by looking at their performance and progress. These sections evaluate milestones related to measurable indicators for the watershed goals and objectives.

### NOTEWORTHY: WHAT ARE GOALS VERSUS OBJECTIVES?

#### GOALS:

- Mini vision statements or targets for the watershed plan.
- The desired change or outcome you wish to achieve.
- Driven by stakeholder issues and problems identified by the watershed assessment.
- Ideally will be clear, concise, and measurable.

#### OBJECTIVES:

- Specific, more precise steps needed to attain goals.
- Position reached or purpose achieved by some activity by a specific time.
- Objective outcomes should be measurable, attainable, relevant, and time-based.
- There may be multiple objectives to achieve a goal(s).

### 2.4.1 WATERSHED GOAL #1: WATER QUALITY IMPROVEMENTS

**GOAL:** Improve water quality and prevent future pollution impacts to streams, lakes, ponds, and wetlands within the DPR planning area.

**OUTCOME:** *Overall water quality is improved. Water bodies will fully support their designated uses (are not impaired).*

#### OBJECTIVES:

- a) Develop and implement a watershed monitoring program to collect and assess physical, chemical, and biological water quality data on streams and lakes on a regular basis.

**Indicator:** Watershed stream annual monitoring program support. Implementation of watershed monitoring program for lakes.

- b) Continue to monitor water quality in the DPR planning area and develop strategies to address water quality impairments and causes of impairments.



**Figure 2-1: Butler Lake algae**



**Indicator:** Number of water bodies removed from the Illinois EPA's impairments list.  
Number of causes of impairment removed.

- c) Reduce the quantity of road salt (sodium chloride) needed for safe and cost-effective winter maintenance to reverse the current trend of rising chloride levels in water bodies.

**Indicator:** Winter Maintenance Program establishment including: policy and manual development, de-icing workshop attendance and certification.

- d) Reduce phosphorus loads by:

- Using conservation practices on all agricultural fields to reduce soil loss;
- All municipalities and the County pass ordinances that restrict the use of lawn fertilizer with phosphorus;
- Implementing effective leaf cleanup and composting programs;
- Removing phosphorus from wastewater discharges;
- Upgrading poorly functioning septic systems; and
- Addressing re-suspension of phosphorus in lakes where feasible.

**Indicator:** Number of local units of government that adopt a phosphorous ordinance.

Number of exceedances of permitted phosphorus concentrations from wastewater treatment plant effluent.

Number of agricultural BMPs implemented that target phosphorous.

Number of upgraded septic systems.

Number of municipalities that have codes that allow or require green infrastructure for stormwater management.

- e) Where appropriate, remove or retrofit impoundments, dams, and weirs in streams to support fish passage and migration, natural baseflow conditions, and to improve dissolved oxygen levels.

**Indicator:** Number of dams and impoundments removed or retrofitted.

- f) Reduce sediment and excessive debris accumulation in surface waters by reducing streambank, shoreline, and construction-related erosion throughout the watershed.

**Indicator:** Reduction in concentrations of total suspended solids (TSS).

Linear feet of streambank and shoreline restored.

- g) Reduce or eliminate harmful algae blooms in lakes.

**Indicator:** Number of algae blooms reported. See Figure 2-1 for an example of an algae bloom in Butler Lake.

- h) Reduce fecal coliform pollution by regulating septic system construction and maintenance, requiring regular maintenance, and enforcing ordinances that require proper cleanup and disposal of pet waste.

**Indicator:** Percentage of identified sources of fecal coliform addressed.

- i) Reduce the use of coal tar sealants for parking lots and driveways.

**Indicator:** Concentration of PAHs detected in water quality/sediment monitoring efforts.

- j) Prepare pollution prevention plans to address emergency response for potential catastrophic environmental events, such as pipeline leaks and flooding.

## DES PLAINES RIVER WATERSHED-BASED PLAN - 2018

**Indicator:** Number of MS4 communities maintaining a database of pollution prevention plans that address emergency response to catastrophic events.

- k) Minimize runoff volumes, velocities, and pollutants to waterways by utilizing wetlands, natural landscapes, and stormwater BMPs such as infiltration and pollutant filtration systems.

**Indicator:** Number of action recommendations completed.

### 2.4.2 WATERSHED GOAL #2: REGIONAL GREEN INFRASTRUCTURE AND NATURAL RESOURCES IMPROVEMENTS

**GOAL:** Protect, enhance, and restore natural resources (soil, water, plant communities, and fish and wildlife) by employing good natural resource management practices. Using green infrastructure on public and private properties to maintain, enhance, or restore natural hydrology, native plant and wildlife communities, provide buffers for streams, lakes, wetlands, and high-quality areas (see Figure 2-2). Expand environmental corridors to provide ecological, educational, and recreational benefits.



**Figure 2-2: Parking lot bioswale with native vegetation**

**OUTCOME:** Natural resources are protected, establishing a series of interconnected hubs and corridors that work to preserve and enhance the high-quality natural areas of the watershed.

#### OBJECTIVES:

- a) Protect and expand ecological quality of aquatic and terrestrial resources by improving water quality and eradicating invasive species, while preserving and protecting threatened and endangered species and ecosystems.

**Indicator:** Number of water bodies removed from the Illinois EPA's impairments list.

Number of causes of impairment removed.

Area of open space identified and preserved for environmental and recreational natural areas.

Acres of invasive species removal/management projects.

- b) Restore degraded terrestrial and aquatic (lakes, wetlands, and streams) resources using restoration best practices to improve habitat.

**Indicator:** Area of degraded natural communities restored.

- c) Maintain, expand, or restore high-quality native plant buffers along rivers, streams, lakes, and wetlands.

**Indicator:** Length of native plant buffers along water bodies maintained, expanded, and/or restored.

- d) Preserve, restore, and create wetlands areas with a target of a minimum 10% wetland land cover per subwatershed.

**Indicator:** Acres of wetlands enhanced and/or restored.

- e) Identify and preserve natural areas that provide important ecological, environmental, educational, and recreational activities, such as swimming, hiking, fishing, biking, riding, canoeing, and bird watching.

**Indicator:** Area of open space identified and preserved for environmental and recreational natural areas.

- f) Identify and connect environmental corridors across community, county and state lines, and create trail connections between new and existing parks and forest preserves where appropriate.

**Indicator:** Number of new trail connections.

- g) Assess current fish population and reduce or eradicate common carp and other invasive aquatic species in lakes.

**Indicator:** Number of lake management plans developed to address aquatic resource trends based on lake reports.

Number of lake management plan project recommendations implemented

- h) Develop an aquatic plant management plan (APMP) for lakes and streams that targets the reduction of invasive species and promotes native plant diversity.

**Indicator:** Number of lakes with Aquatic Plant Management Plans (APMP).

- i) Reduce/eliminate presence of invasive species in the watershed, particularly in riparian and buffer areas.

**Indicator:** Acres of invasive species removal/management projects.

- j) Reintroduction of extirpated native species as water resources or ecosystems improve (such as blanding turtles).

**Indicator:** Number of successful reintroductions of threatened and endangered native species into natural habitats.

### 2.4.3 WATERSHED GOAL #3: FLOOD DAMAGE REDUCTION

**GOAL:** Reduce current flood damage in the DPR planning area and prevent future flooding from worsening in the watershed and along the Des Plaines River downstream of Lake County.

**OUTCOME:** Flood damages are reduced to the maximum extent achievable and impacts to residents, businesses, institutions, governments, and natural resources in the DPR planning area are minimal.

#### OBJECTIVES:

- a) Create additional flood storage at regional wetland restoration or flood storage sites in Illinois and Wisconsin to reduce flooding and prevent downstream erosion.

**Indicator:** Area of new or restored flood storage sites.

- b) Reduce existing flood damage and number of flood problem areas through the implementation of flood mitigation projects. See Figure 2-3 for sandbagging efforts at Gurnee Grade School during a flood event.

**Indicator:** Number of flood problem areas positively affected by flood mitigation projects implemented.

- c) Residents protect themselves from the impacts of flood damage by obtaining flood insurance and installing individual property mitigation measures.

**Indicator:** Number of flood insurance policies in the watershed communities.

Number of Lake County Floodproofing Workshop attendees.



**Figure 2-3: Sandbagging efforts to reduce flooding**

## DES PLAINES RIVER WATERSHED-BASED PLAN - 2018

- d) Use infiltration and evapotranspiration provided by green infrastructure to reduce volume of runoff and flood damage.

**Indicator:** Number of action recommendations completed.

- e) Identify and install overland flow routes for all detention facilities and flood prone and depressional areas where needed.

**Indicator:** Number of mapped overland flow routes.

- f) Require more specific/stringent maintenance and drainage easement requirements for stormwater features in new developments and re-developments.

**Indicator:** Number of municipalities that have codes that allow or require green infrastructure for stormwater management.

- g) Maintain and increase local drainage system capacity to mitigate flood damage and improve resiliency for changing precipitation patterns.

**Indicator:** Number of local drainage system improvement projects implemented.

- h) Remove excessive debris loads in channels to maintain conveyance and reduce streambank erosion.

**Indicator:** Number of communities with established stream maintenance programs.

- i) Support updating of outdated floodplain maps to accurately identify current flood hazard areas.

**Indicator:** Number of updated FEMA floodplain maps (less than 10 years old).

- j) Purchase and remove structures that are chronically damaged by flooding through the voluntary buyout program.

**Indicator:** Number of Voluntary Floodplain Buyouts.

- k) Reduce the number of flood damage claims from major flood events.

**Indicator:** Number/value of claims filed each year per community in the watershed.

### 2.4.4 WATERSHED GOAL #4: FUNDING, INSTALLING, AND MAINTAINING STORMWATER INFRASTRUCTURE

**GOAL:** Reduce the volume and improve the quality of stormwater runoff by installing appropriate gray or green stormwater infrastructure and improving the condition of existing stormwater infrastructure.

**OUTCOME:** Reduce stormwater runoff volume and the pollution reaching and negatively impacting water bodies and natural resources and causing flood damage.

#### OBJECTIVES:

- a) Reduce the rate and volume of stormwater runoff from developed areas and new developments by minimizing impervious cover and implementing stormwater green infrastructure practices that reduce runoff volumes, velocities, and pollutants to waterbodies – through infiltration, evapotranspiration, and storage of rainwater on-site.



**Figure 2-4: Protected culvert**

A trash rack reduces debris and stone riprap reduces erosion.

**Indicator:** Number of action recommendations completed.

- b) Expand funding opportunities, including alternative funding mechanisms, technical assistance, and maintenance resources, for improving stormwater green infrastructure and BMPs.

**Indicator:** Number of cost-sharing programs available in the DPR planning area  
Amount of grant funding available for stormwater green infrastructure and BMPs.

- c) Develop standards/guidelines for use of green infrastructure for stormwater management in site planning and design, including strategically connecting to off-site green infrastructure.

**Indicator:** Number of municipalities that have codes that allow or require green infrastructure for stormwater management.

- d) Increase education and political desire to provide funding and technical analysis for improving local and countywide regulations pertaining to impervious surface stormwater runoff and BMPs.

**Indicator:** Number of local, county, and state representatives provided educational outreach materials for improving local and countywide regulations.

- e) Increase funding committed for in-the-ground stormwater BMPs.

**Indicator:** Funding increase for in-the-ground stormwater BMPs.

- f) Retrofit and maintain existing stormwater management structures, such as detention basins, to provide water quality, natural resource and flood prevention benefits, and ensure design standards for new basins incorporate multiple benefits. See Figure 2-4 for an example of a protected culvert with a trash rack which reduces debris and stone riprap that reduces erosion.

**Indicator:** Number of existing stormwater management structures retrofitted.  
Number of developments built using conservation design principles and/or green infrastructure.

- g) Clear, repair, or replace blocked, damaged, and failing culverts, outfall pipes, swales and ditches, and other stormwater conveyance infrastructure to maintain conveyance and reduce erosion.

**Indicator:** Potential maintenance needs identified in future stream and detention basin inventories.

- h) Establish and implement a watershed-wide stream and river maintenance program using the American Fisheries Society standards as guidelines.

**Indicator:** Number of communities with established stream maintenance programs.

- i) Design and install stormwater BMPs to capture and treat roadway stormwater runoff.

**Indicator:** Lane miles of roadway retrofitted or constructed with BMPs.

- j) Identify who is responsible for maintenance activities for stormwater gray/green infrastructure practices.

**Indicator:** Number of informational guides on roles and responsibilities for stormwater gray/green infrastructure maintenance distributed.

- k) Utilize modeling and monitoring to evaluate whether design predictions and the performance goals for stormwater infrastructure are being achieved.

**Indicator:** Number of compliant site inspections performed during the 10-year operation and maintenance period for Illinois EPA 319 grant funded projects.



## DES PLAINES RIVER WATERSHED-BASED PLAN - 2018

### 2.4.5 WATERSHED GOAL #5: COMMUNITY AND AGENCY COORDINATION

**GOAL:** Improve coordination, research, and decision-making among public, private, and non-profit entities to help achieve watershed plan goals and objectives.

**OUTCOME:** Watershed stakeholders coordinate and utilize all of their local resources to implement watershed improvement projects.

#### OBJECTIVES:

- a) Watershed communities adopt the Des Plaines River Watershed-Based Plan.

**Indicator:** Number of municipalities, counties, and natural resource agencies that adopt the Des Plaines River Watershed-Based Plan.

- b) The DRWW will continue to monitor water quality and develop strategies to address water quality impairments in the DPR planning area.

**Indicator:** Watershed stream annual monitoring program support.

- c) Establish a watershed organization or committee with funding and support to guide watershed plan implementation, provide technical assistance to watershed stakeholders, and coordinate multi-partner projects (see Figure 2-5 as an example of a multi-partnership project).

**Indicator:** Establishment of lead organization (watershed planning committee) with budget and executive committee.

Number of projects advanced/undertaken with the support of the watershed planning committee.

- d) Communities and organizations will designate a representative and participate in the watershed committee.

**Indicator:** Communities and organizations have designated an individual or board member(s) representative to participate on the watershed planning committee.

- e) Land use planning jurisdictions will consider the watershed plan recommendations when developing local comprehensive plans and making land use decisions.

**Indicator:** Number of municipalities implementing watershed site-specific and programmatic actions.

- f) Strengthen and better enforce consistent regulations and standards intended to protect and preserve watershed natural resources.

**Indicator:** Number of communities that have ordinances and programs that protect and preserve watershed natural resource areas.

Number of municipalities that have codes that allow or require green infrastructure for stormwater management.

- g) Increase citizen scientist monitoring through River Watch and VLM programs.



**Figure 2-5: Multi-partnership project groundbreaking ceremony**  
Groundbreaking Ceremony for the Lake County Central Permit Facility and Consolidated Environmental Lab in Libertyville, Illinois.

**Indicator:** Number of RiverWatch sites/lakes enrolled in volunteer/citizen scientist river and lake monitoring programs.

- h) Watershed committee annually assesses progress on plan implementation and provides updates to the watershed-based plan every 10 years.

**Indicator:** Number of watershed stakeholders providing feedback for the watershed report cards.

## 2.4.6 WATERSHED GOAL #6: SUSTAINABLE AGRICULTURE SYSTEMS

**GOAL:** Watershed stakeholders participate in farmland preservation programs and implement sustainable agricultural practices to accomplish other watershed goals and objectives.

**OUTCOME:** *The plan encourages farmland preservation and sustainable agriculture practices in the watershed.*

### OBJECTIVES:

- a) Install and expand agricultural BMPs, including drainage and tillage, to reduce sediment, chemical, and nutrient transport to water bodies in the DPR planning area.

**Indicator:** Number and area of agricultural BMPs installed.

- b) Create and implement Resource Management Plans (RMPs) for all farms, equestrian facilities, and nurseries in the watershed.

**Indicator:** Number or percent of farms, equestrian facilities, and nurseries with RMPs.

- c) Maintain BMPs to reduce sediment transport to water bodies and investigate opportunities for showcasing end-of-tile water quality BMPs at a demonstration site.

**Indicator:** Number of high priority sediment reduction agriculture BMPs installed.

Demonstration site established and monitored.

Length of drain tile removed or disabled.

- d) Investigate opportunities for a farmland preservation program (Illinois and Wisconsin portions of the watershed may require separate programs), and partner with existing farmland protection groups to share knowledge and provide support.

**Indicator:** Number of county and municipal agencies that have adopted a farmland preservation program(s).

- e) Conserve soils by using erosion control measures on farms and utilizing farming best practices to reduce erosion. See Figure 2-6 for an example of a grassed waterway BMP.

**Indicator:** Acres of cover crops or crop residue left on fall agricultural fields.



**Figure 2-6: Grassed waterway installed as an agriculture BMP**

Photo Credit: NRCS New York Photo Gallery  
([https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/?cid=nrcs144p2\\_027319](https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/?cid=nrcs144p2_027319))

## DES PLAINES RIVER WATERSHED-BASED PLAN - 2018

Acres of waterway, wetland, water and sediment control basin (WASCOB), field border, filter strip, grade stabilization structure (GSS) and other erosion control agriculture BMPs that are implemented, enhanced, or restored.

- f) Expand sustainable local agricultural production, including small scale and local farming to preserve prime farmland (i.e., native plant nurseries and Farm to Table initiative).

**Indicator:** Number of prime farm acres in production.

### 2.4.7 WATERSHED GOAL #7: EDUCATION AND OUTREACH

**GOAL:** Provide watershed stakeholders with the knowledge, skills, and motivation needed to take action to implement the watershed plan. Watershed stakeholders include (but are not limited to): residents, property owners, property owner associations, government agencies, jurisdictions, and developers.

**OUTCOME:** Stakeholders have adequate information and knowledge of resources to implement the watershed plan.

#### OBJECTIVES:

- a) Educate and provide information and training to riparian and lakeshore landowners on best practices for stream and lake shoreline restoration and maintenance that will reduce erosion and increase water quality.

**Indicator:** Number of landowners that receive information about best practices for stream and lake shoreline restoration and maintenance.

- b) Conduct a watershed outreach campaign to inform and engage the public about watershed issues, landowner responsibilities, and available resources. See Figure 2-7 watershed planning committee meeting.

**Indicator:** Number of people reached by watershed outreach campaign.

- c) Educate local government officials and agencies, consultant and contractors working in the watershed, landscapers and nurseries, and landowners on road salt alternatives and application BMPs to minimize the use of road salt by public and private snow removal providers.

**Indicator:** Number of public agencies and local private contractors attending the annual Lake County De-icing Workshop.

Number of public agencies with winter maintenance responsibilities that use alternative de-icing products.

- d) Educate the general public on the importance of watershed health (water quality, flood prevention, soil conservation and agricultural production, green infrastructure, and water-based recreation) to the economy, culture and quality of life in communities.



**Figure 2-7: Watershed planning committee**  
Stakeholders developed watershed goals and objectives.



**Indicator:** Number of property owners that receive information about the importance of watershed health.

- e) Utilize trainings, workshops, public meetings, newsletters, websites, media, campaigns, and stakeholder word of mouth to provide watershed stakeholders opportunities to participate in watershed programs and projects.

**Indicator:** Number of landowners that receive information about watershed programs and projects.

Number of workshops.

Number of action recommendations completed.

Continuous increase in number of contacts on the SMC Des Plaines River watershed contact database.

- f) Develop and implement a pollution prevention campaign to educate residents, businesses, developers and homebuilders on source control and runoff reduction measures that may be used on their properties. These measures can be used to reduce or eliminate pollution inputs associated with landscape maintenance and agricultural production.

**Indicator:** Pollution prevention campaign established.

- g) Facilitate public training and engage schools and youth groups (students), lake associations, and homeowner associations to volunteer for lake, stream, and natural area stewardship and maintenance.

**Indicator:** Number of volunteers for lake, stream, and natural area stewardship and maintenance.

- h) Promote the use of native plants and the removal of invasive plants by establishing demonstration sites and training.

**Indicator:** Number of native plant demonstration sites established, and trainings held.

- i) Provide communities with the tools they need to prevent flood damage from worsening by using the “no adverse impact standard” and maintaining floodplain as open space.

**Indicator:** Number of communities that adopt the “no adverse impact standard.”

- j) Provide outreach and workshops for the public affected by flood damage to educate them on the causes of flooding, flood mitigation practices, and what can be done to prevent local and regional flood damage.

**Indicator:** Number of educational flyers or mailings to high flood risk property owners about flood mitigation measures.

Number of clicks (overall activity) on SMC website flooding resources.

- k) Install signs at each lake to educate riparian and lakeshore landowners and lake users on ways to reduce the spread of aquatic invasive species.

**Indicator:** Number of educational signs regarding aquatic invasive species installed.